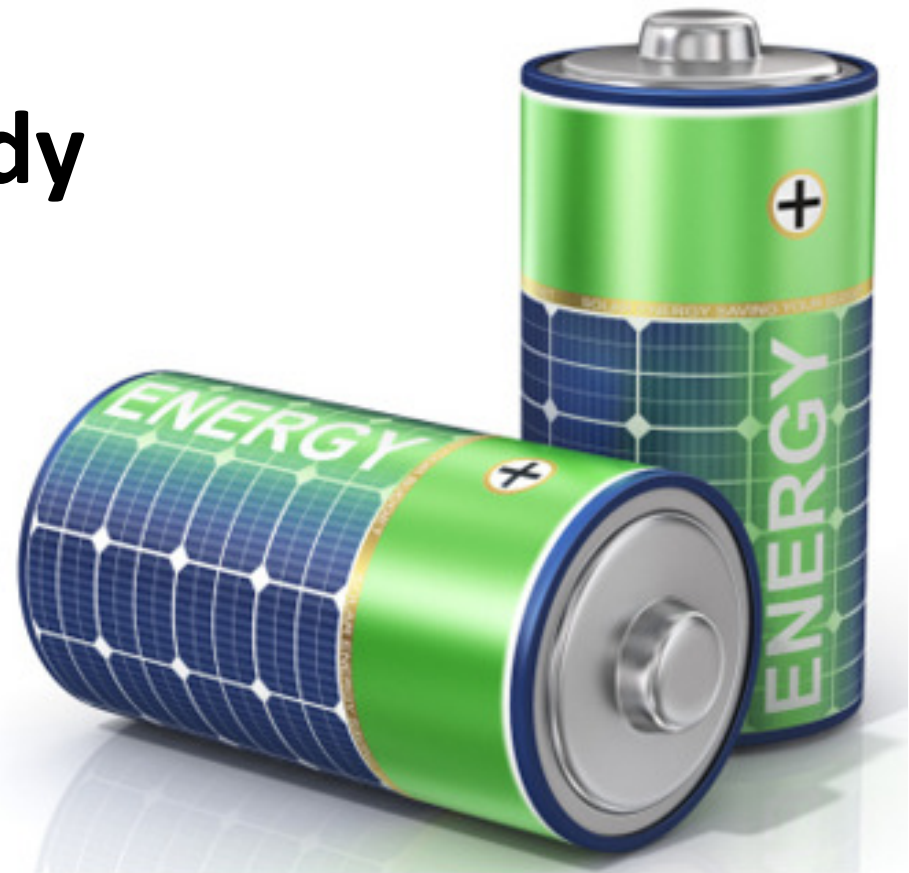


HB 773 / SB 715 Energy Storage Study

PPRAC Status Update
November 15, 2017



Project Milestones (2018)

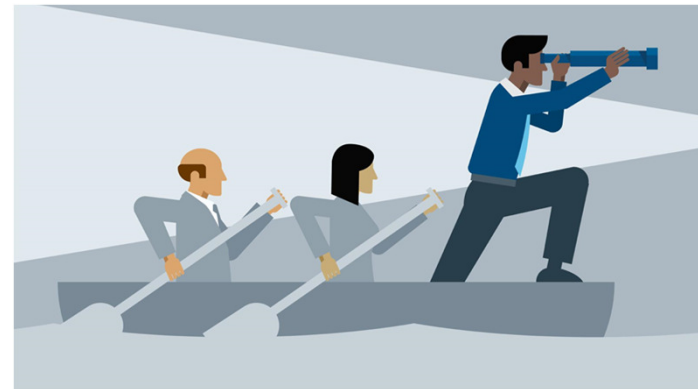


- January - Preliminary Findings/Status Report to GAM
- April - Initial Draft Report
- July - Draft Report
- August - Public Meetings
- October - Executive Review
- December - Final Report to GAM

Project Strategy



- 1-on-1 conversations with stakeholders
- Site visit(s) to view and discuss one or more working energy storage systems in the region
- Literature review (reports by EEI, EPRI, ESA, FERC, IREC, PJM, RMI, other states, etc.)
- News monitoring (Energy Storage News, GreenTech Media, Utility Dive, etc.)
- Public meeting(s) to preview major findings and invite feedback on Draft Report



- PPRAC Energy Storage Work Group meetings (quarterly)
- PPRAC meetings (biannual)

Summer/Fall Activities



- **Meetings/Calls with Storage Development Community**

- Energy Storage Association, Edison Energy, Ingersoll Rand and Calmec, Flonium, Schneider Electric, Sunverge, Tesla, WindSoHy

- **Meetings/Calls with Other Stakeholders**

- Alevo Analytics, Bloom Energy, Edison Electric Institute, Delegate Korman, Maryland Clean Energy Center, Montgomery County, PJM, UMD Energy Innovation Institute

- **Meetings/Calls with Utilities**

- BGE, Exelon, Pepco



Activities continued



- **State Agency Coordination**

- Monthly MEA-PSC-PPRP calls
- Ongoing monitoring of PC 44 Integration & Energy Storage Working Groups
- Meeting with PSC staff experts to discuss regulatory sections of Energy Study outline
- Coordination with Andrew Johnston on meetings/calls with stakeholders

Activities continued



Energy Storage Update Status, Trends, Research Directions, and Resources

Ben Kaun

Program Manager, Energy Storage and Distributed
Generation

**Presentation to Maryland PSC Energy Storage
WG**

15 July 2017

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Activities continued



Activities continued



- **Work Group Meetings**

- Meeting #1: July 17th Teleconference Call

- Report outline
 - Strategy and deadlines
 - Member goals

- Meeting #2: October 26th

- Overview of energy storage use case universe
 - Primary barriers to storage in Maryland

- Meeting #3:

- Wednesday, January 17th, 9AM - 12PM**

- DNR C-1 Conference Room, Annapolis, MD**

- Preliminary findings and status report to GAM
 - Ownership discussion (PC-44) - ?

Activities Continued



- **Report Development**

- Style guide completed
- Drafting
 - 2. Storage Technologies*
 - 4. Status of Storage in Maryland*
 - 5. Policies in Other States*
- Researching/Outlining
 - 3. Cost and Value of Storage*
 - 6. Revisions to Regulatory Policies*
 - 7. Wholesale Market Factors*

Next Steps



- **Meetings/Calls with Stakeholders**

- American Wind Energy Association, Solar Energy Industries Association
- American Public Power Association, National Rural Electric Coop Association
- BGE, SMECO

- **Ongoing**

- PC-44 monitoring
- PSC-MEA-PPRP coordination
- Research/outlining/writing

- **Next Work Group Meeting:**

- Wednesday, January 17th, 9-12, DNR C-1 Conference Room

Initial Findings – Barriers in MD



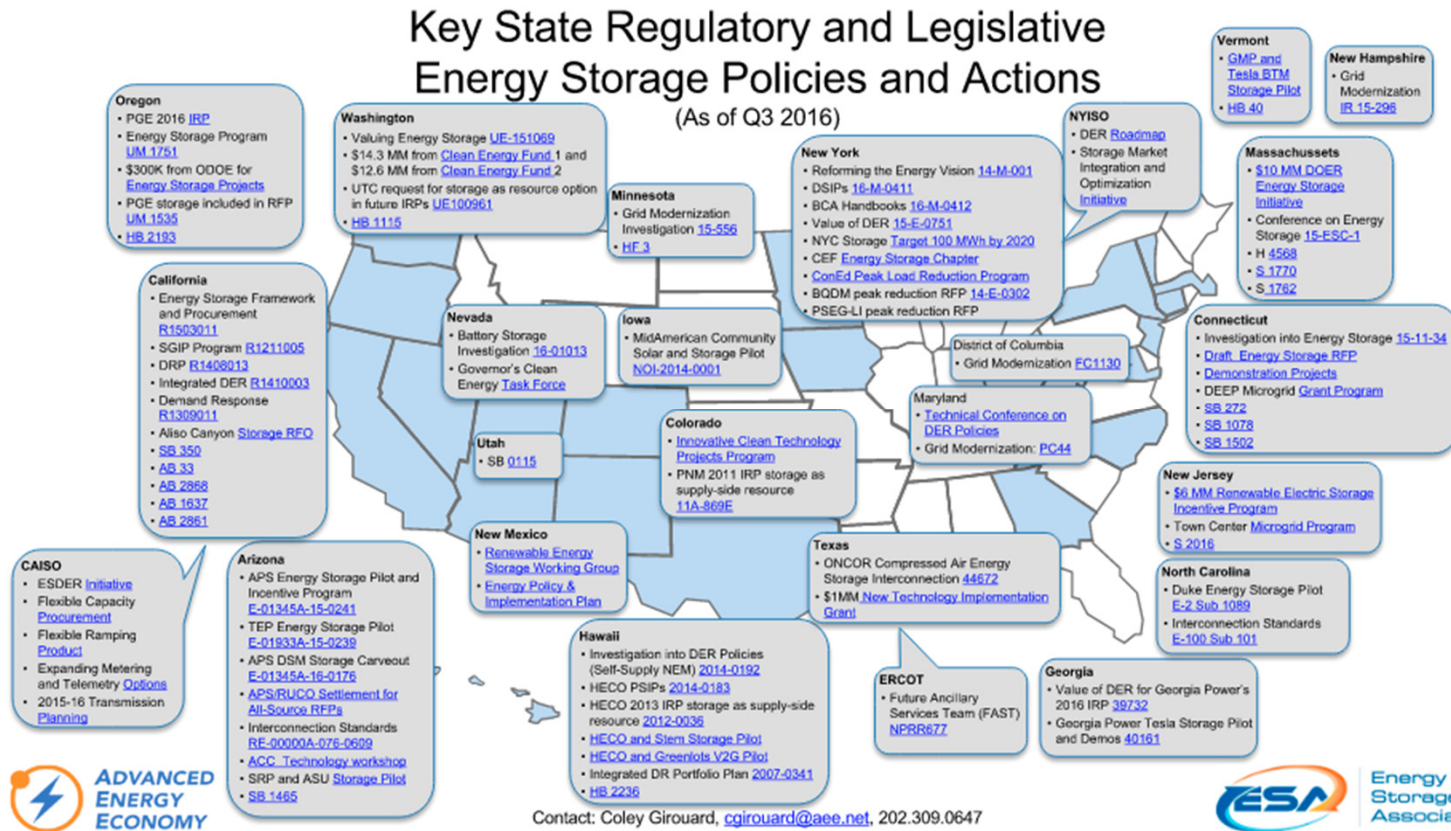
Based on PPRP discussions with stakeholders across the energy industry

- **Costs**
 - High capital costs/expensive financing
- **Value**
 - Inability to capture multiple revenue streams
- **Ownership**
 - Lack of clarity regarding utility ownership/cost recovery
- **Education**
 - Knowledge gaps about non-battery technologies and uses
 - Lack of first-hand experience, real-world data
- **Interconnection**
 - Uncertain, complicated, long processes
- **Rate Signals**
 - Low electricity costs/demand charges for customers
 - Lack of incentives to optimize T&D systems
- **Evaluation Methods**
 - Models use outdated stats/only quantify some benefits
- **Wind/Solar**
 - Modest capacity to pair with storage

Background Research – Actions by Other States



There's (still) a lot happening. Illustrative examples to follow...



Mandates and Targets



State	Description
CA	IOUs must procure 1.3 GW by 2020.
MA	IOUs assigned "aspirational target" of 200 MWh by 2020.
NV	TBD based on storage cost-effectiveness study due 2018.
NY	IOUs must have 2 projects by 2018; bill to set mandate under review by governor.
OR	IOUs must procure 10 MWh by 2020.

Grants and Loans



State	Total Funds (\$M)	Eligible Parties	Description
CA	1,296	Individuals, public and private entities	The CEC-administered Electric Program Investment Charge program supports clean energy technologies via: (1) Applied research and development; (2) Technology demonstration and deployment; and (3) Market facilitation.
CT	30	Municipalities	The DEEP-administered Microgrid Program offers grants to support critical facilities. Storage must be paired with RE or CHP. Up to \$4M is available per project. Winners may apply for loans of up to \$2M from CT Green Bank.
NY	16	Businesses (main proposer)	The NYSERDA-administered Demonstrating Energy Storage for Stacking Customer and Grid Values Program funds demo projects that tackle operational, regulatory and business model complexities of value stacking. 50% co-funding required.

Rebates and Incentives



State	Total Funds (\$M)	Description
CA	566	The CPUC-administered Self-Generation Incentive Program (SGIP) offers rebates for all BTM-distributed energy resources. Storage systems between 10 kW and 5 MW eligible.
MD	3.75	The MEA is to administer 30% income tax credits for storage systems. Credit capped at \$5,000 for residential and \$75,000 for commercial.
NV	5*	The NPUC is establishing energy storage incentives under the Solar Energy Systems Incentives Program.
NJ	1.5**	The Renewable Electric Storage Program offered a \$300/kWh incentive to non-residential, 100+ kWh, BTM, storage + renewable energy projects.

*Total money allotted to storage **Based on RES Report of funded projects

Regulatory Updates



Topic	Examples and Notes
Utility Ownership/ Cost Recovery	<ul style="list-style-type: none">• MA and NY have explicitly allowed IOU ownership in the context of a deregulated state• CO gave Xcel deferred rate base approval for two customer-sited solar + storage projects• CA is working on a framework that would allow IOUs to seek compensation for all storage services under one filing
Interconnection	<ul style="list-style-type: none">• NC and SC have clarified that storage can use same interconnection procedures as other “small generation facilities”• CA is working on an expedited review process for non-exporting systems
Net Energy Metering (NEM)	<ul style="list-style-type: none">• CA set size limits for NEM solar + storage units and created an export estimation methodology for small, meterless solar + storage units

System Planning



Topic	Examples and Notes
Energy Storage Potential	<ul style="list-style-type: none">• OR requires IOUs to conduct energy storage potential evaluations for their systems
Non-Wires Alternatives (NWA)	<ul style="list-style-type: none">• ME requires IOUs to consider NWAs and earn a rate of return on all NWA expenditures (including operating expenses)
Hosting Capacity	<ul style="list-style-type: none">• CA is refining a methodology to identify where DERs can connect to the distribution system
Locational Value	<ul style="list-style-type: none">• NY is moving to replace NEM with rates that reflect the locational and environmental benefits of distributed energy resources
Performance-Based Incentives	<ul style="list-style-type: none">• PA is investigating PBIs that include grid efficiency improvements

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